

Please type a plus sign (+) inside this box ☐

+

PTO/SB/05 (4/98)
Approved for use through 09/30/2000. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**UTILITY
PATENT APPLICATION
TRANSMITTAL**

Only for new nonprovisional applications under 37 C.F.R. § 1.53(b)

Attorney Docket No.	97RSS430/71392
First Inventor or Application Identifier	Anthony J. Dezonno
Title	SELECTIVE MESSAGING IN A MULTIPLE MESSAGING LINK ENVIRONMENT
Express Mail Label No.	EL133504352US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO:

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ *Fee Transmittal Form (e.g. PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☒ Specification (preferred arrangement set forth below) Total Pages **15**
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure
3. ☒ Drawing(s) (35 U.S.C. 113) Total Sheets **3**
4. ☒ Oath or Declaration Total Pages **2**
a. ☒ Newly executed (original or copy)
b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

5. ☐ Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
a. ☐ Computer Readable Copy
b. ☐ Paper Copy (identical to computer copy)
c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers (cover sheet & document(s))
8. ☐ 37. C.F.R. § 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney
9. ☐ English Translation Document (if applicable)
10. ☐ Information Disclosure Statement (IDS) PTO-1449 ☐ Copies of IDS Citations
11. ☐ Preliminary Amendment
12. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
13. ☐ *Small Entity Statement(s) (PTO/SB/09-12) ☐ Statement filed in Prior application, Status still proper and desired
14. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
15. ☐ Other: _____

NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

16. If a **CONTINUING APPLICATION**, check appropriate box, and supply the requisite information below and in a preliminary amendment

☐ Continuation ☐ Divisional ☐ Continuation-In-Part (CIP) Of prior application No.: _____ / _____

Prior application information: Examiner _____

Group/Art Unit: _____

FOR CONTINUATION or DIVISIONAL APPS ONLY: The entire disclosure of the prior application, from which an oath or declarations supplied Under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by Reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label (Insert Customer No. or attach bar code label here) or ☒ Correspondence address below

Name	Jon P. Christensen, Esq.				
	WELSH & KATZ, LTD.				
Address	120 S. Riverside Plaza				
	22 nd Floor				
City	Chicago	State	Illinois	Zip Code	60606
Country	US	Telephone	(312) 655-1500	Fax	(312) 655-1501
Name Print/Type	Jon P. Christensen			Registration No. (Attorney/Agent)	34,137
Signature				Date	2/9/99

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Office, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

SELECTIVE MESSAGING IN A MULTIPLE MESSAGING LINK
ENVIRONMENT

5

Field of the Invention

The field of the invention relates to automatic call distributors and more particularly to peripheral devices attached to automatic call distributors.

10

Background of the Invention

Automatic call distributors (ACDs) are known. Such devices are typically used by service organizations where ever a large number of calls must be matched with a limited number of agents. The calls handled by ACDs may be either incoming or outgoing.

Sales organizations may use automatic call distributors (ACDs) to receive and distribute incoming calls to customer service agents. Often the sales organization will disseminate a single telephone number to its customers. As customers call the telephone number, the calls must be distributed to the organization's agents. In order to distribute incoming calls, the ACD must first be able to detect an incoming call, then select an available agent and, finally to route the call to the selected agent.

In order to select an agent and equalize a workload among a group of agents, the ACD must be able to detect when an agent is idle (i.e., not occupied with a prior call). When ever an agent is idle, the switch may assign a call to that agent. Idle time, in

I hereby certify that this paper is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on this date.

2-9-99

Date

Express Mail Label No.

EL133504352US

fact, is often used as a equitable means of determining which agent will receive the next incoming call.

In the case of either incoming or outgoing calls, it is important for an agent working at an agent station to have ready access to customer records. In addition to a telephone, an agent station also typically includes a computer terminal coupled to a system database (host) for purposes of providing and maintaining customer records. While an agent could individually identify customers to the host by the manual entry of a customer identifier, it is generally more efficient that the ACD identify a customer to the host.

Typically, the ACD identifies the customer to the host by use of the customer telephone number. On either incoming or outgoing calls, the ACD transfers the telephone number to the host along with an identifier of a selected agent when the call is assigned to the agent. In the case of incoming calls, the ACD may identify a caller's telephone number through PSTN features such as automatic number identification (ANI).

In large service organizations, many ACDs and agent groups may exist over wide geographic areas, often in different time zones. ACDs may be interconnected to share call processing. ACDs which become overloaded may transfer (overflow) some calls to other ACDs.

Where a call is transferred from a first ACD to a second ACD, it is important to transfer whatever information exists about the call to a destination ACD. However, a transferring ACD may not know which ACD will

ultimately accept the call. Often, the receiving ACD
is served by a different host than the transferring
ACD. As a consequence, a message transmitted from one
ACD or host is typically transmitted (broadcast) to all
5 connected ACDs and hosts. Further, any message
received by a first ACD or host is automatically re-
broadcast to any other ACD or host connected to the
first ACD or host. As ACD systems have increased in
size, the number of messages transmitted has also
10 increased. In some cases unnecessary messages degrade
system operation. Accordingly, a need exists for a
means of reducing message traffic within an ACD system.

Summary

15 A method and apparatus are provided for forwarding
messages among peripherals of an automatic call
distributor. The method includes the steps of forming
a message table in a first peripheral of the automatic
call distributor and forwarding a message from the
20 first peripheral to a second peripheral of the
automatic call distributor based upon a content of the
message table.

Brief Description of the Drawings

25 FIG. 1 depicts a block diagram of an automatic
call distributor in accordance with an illustrated
embodiment of the invention;

FIG. 2 depicts a messaging table that may be used
30 by the system of FIG. 1; and

FIG. 3 depicts a messaging matrix that may be used
by the system of FIG. 1.

Detailed Description of a Preferred Embodiment

FIG. 1 is a simplified block diagram of an ACD system 10, generally, in accordance with an illustrated embodiment of the invention. The system 10 is provided with programmable messaging links for control of messages which are not of interest to a data device. The use of the programmable messaging link allows the data to remain backwards compatible with existing data applications.

The system 10 may be of a type similar to that provided by any of a number of ACD system makers (e.g., the Spectrum system made by Rockwell International). The Spectrum system typically has a broadcast capability accommodating three data links between peripheral devices. These links broadcast whatever data the Spectrum has among the three links. As such, peripherals may get messages which may not be of interest to the peripheral.

One solution is the development of separate logical links for each of the data paths. However, this requires a large amount of development resources to successfully implement. The programmable messaging link described below provides a much less complex solution.

As shown in FIG. 1, one or more ACDs 14, 16, 18 of the system 10 may receive calls from the PSTN 12 and distribute the calls among a local group of agents (not shown) assigned to each particular ACD 14, 16, 18.

Also shown in FIG. 1 is a host 20, 22, 24 connected to a respective ACD 14, 16, 18. Each host 20, 22, 24 may receive information about calls from it

respective ACD and exchange information about callers with a terminal of an assigned agent.

While each host 20, 22, 24 of FIG. 1 is shown connected to a single ACD 14, 16, 18, it should be understood that each host (e.g., 20) may serve more than one ACD (e.g., 14). Since each host 20, 22, 24 and each ACD 14, 16, 18 performs a supporting function within the system 10, hosts or ACDs may be individually referred to as system peripherals.

As calls are received by the ACDs 14, 16, 18 from the PSTN 12, the PSTN 12 may also transfer destination and source information about each call to the ACD 14, 16, 18. The receiving ACD 14 may assign a call identifier, unique to that ACD, and begin the process of identifying an agent to service that call. The ACD 14, 16, 18 may also transfer a call arrival message to its respective host 20, 22, 24. Alternatively, once the ACD 14, 16, 18 has identified an agent, the ACD 14, 16, 18 may transfer a call assignment message to the host 20, 22, 24. The respective host 20, 22, 24 may broadcast that message to other connected hosts.

In order to reduce message traffic, each peripheral 14, 16, 18, 20, 22, 24 of the ACD system 10 is provided with a message processing table 30 (FIG. 2), which forms a basis for a programmable messaging link. Included within the message table 30 is a message identifier side 32 (shown on the left) and a destination side 34 (shown on the right).

Messages within the system 10 may be forwarded (or not forwarded) based upon a content of the message table 30. For instance, the table 30 may contain indices of messages that are not to be forwarded.

Alternatively, the table 30 may be used to identify messages which are to be forwarded.

Where the table 30 is used for messages which are not to be forwarded, a CPU (e.g., 29) may use the contents of the table 30 as a means of deleting messages. For example, messages may be received in a receive buffer (not shown) of the CPU 29 and be transferred by the CPU 29 to a transmit buffer for transmission (broadcasting) to other connected peripherals. As each message is detected in a receive buffer of the CPU 29, a comparison is made between that message and the individual entries of the table 30. Where a match is found, the message may be deleted before it can be re-broadcast to the one or more connected peripherals.

Alternatively, the table 30 may be used (in an opposite sense) to forward messages. When used in the opposite sense, messages are compared with the table 30 and when a match is found, the message is only forwarded to the destination specified in the table 30.

The message identifier side 32 of the table 30 may be structured to contain a number of message identifiers. Typically each message identifier correlates with a single message destination, but in some cases a particular message identifier may be correlated with many destinations or a destination may be correlated with many types of message identifiers.

A message identifier may refer to a particular type of messages or a message from a particular source. For example, a particular type of message identifier may be "call arrival" message, an "agent assignment" message, a "call overflow" or a "fault message".

Further, the entries of the message identifier side 32 of the message processing table 30 may be further differentiated through use of a message matrix 36 (FIG. 3). A message matrix 36 may be described as a set of attributes that a message may need before it will be forwarded (not forwarded) to a particular destination. For example, one of the messages of the message identifier side 32 of the message table 30 may correspond to one of the lines 38, 40, 42, 44, 46, 48, 50 of the message matrix 36.

As a more specific example, the table 30 of FIG. 2 may reside in a memory 28 the second host 22. Message #1 of the message identifier side 32 of the table 30 may correspond to the second line 40 of the message matrix 36 of FIG. 3. A destination "a" of the destination side 34 may correspond to the first host 20.

As messages are received by the second host 22, they are compared to the message identifiers on the message identifier side 32 of the forwarding table 30. In the example above, where a message is identified as being from third host 24 regarding fault messages about ANI, that message would be sent (not sent) to the requesting host 20 depending upon the use of the message table 30.

As another example, message identifier #5 of the message identifier side 32 of FIG. 2 may correspond to the first line 38 of the message matrix 36. Further, destination "d" may correspond to the third host 24. In this example, overflow messages from the ACD 14 of the first host 20 regarding overflow calls from agent

#1 would be sent (not sent) to the third host 24 depending upon the use of the message table 30.

The message table 30 and message matrix 36 may be created during startup of the system 10 and modified during use. For example, the third host 24 may wish to receive all (or none of the) messages from the first ACD 14. Upon startup, the third host may by reference to a lookup table and determine that the first ACD 14 may be contacted through the second host 22. As such, the third host 24 sends a message to the second host 22 concerning messages from the first ACD 14.

The second host 22 by reference to its own lookup table determines that the first ACD 14 is not directly connected to it and therefore sends a message to the first host 20 concerning the messages from the first ACD 14. The second host 22 also makes an entry in its own table 30. On the right side 34, the second host 22 enters an identifier of the third host 24. On the left side 32 on the same line, the second host 22 enters an identifier of the message or, where necessary, a reference to a particular line 38 of the message matrix 36. Where a reference is made to a particular line 38 of the message matrix 36, the second host 22 enters an identifier of the ACD 14 and other information into an appropriate position of the reference line 38.

Similarly, when the first host 20 receives the request regarding the messages from the first ACD 14, the first host 20 makes an entry into its forwarding table. By reference to a lookup table, the first host 20 determines that the first ACD 14 is connected directly to it and enters an identifier of the first ACD 14 (as a type of message identifier) on the left

side 32 of its forwarding table 30. The first host 20 also enters an identifier of the second host 22 on the right side 34 of its table 30 on the same line.

The use of the message table 30 allows a
5 peripheral to selectively exclude messages, or message elements which are not of interest to the peripheral. The table 30 allows peripherals to send programming messages on initialization of the peripheral to specify the messages it does not want to see (or which it does
10 want to see) on the messaging link. The programming messages and table 30 may be used as part of a simple messaging filter which may functions to reduce or exclude messages over a particular link. This effectively provides the same sort of functionality as
15 having separate logical links.

A specific embodiment of a method and apparatus for select messaging in a multiple messaging link environment according to the present invention has been described for the purpose of illustrating the manner in
20 which the invention is made and used. It should be understood that the implementation of other variations and modifications of the invention and its various aspects will be apparent to one skilled in the art, and that the invention is not limited by the specific
25 embodiments described. Therefore, it is contemplated to cover the present invention any and all modifications, variations, or equivalents that fall within the true spirit and scope of the basic underlying principles disclosed and claimed herein.

Claims

1. A method of forwarding messages among peripherals of an automatic call distributor, such method comprising the steps of:

- 5 forming a message table in a first peripheral of the automatic call distributor; and
- forwarding a message from the first peripheral to a second peripheral of the automatic call distributor based upon a content of the message table.

10

2. The method of reducing message traffic as in claim 1 further comprising entering an identifier of a message to be forwarded into the formed message table in the peripheral.

15

3. The method of reducing message traffic as in claim 2 wherein the step of entering the identifier of the message further comprises entering a corresponding destination identifier to the entry.

20

4. The method of reducing message traffic as in claim 3 wherein the step of entering the identifier further comprising providing a reference to a line of a message matrix.

25

5. The method of reducing message traffic as in claim 4 wherein the step of sending the list of unnecessary messages further comprises storing the list in said table of the automatic call distributor.

30

6. The method of reducing message traffic as in claim 5 further comprising forming a message for transmission to a set of peripherals, including said peripheral.

5 7. The method of reducing message traffic as in claim 6 wherein the step of forming a message for transmission to a set of peripherals further comprises retrieving an identifier of said peripheral of the set of peripherals.

10

8. The method of reducing message traffic as in claim 7 wherein the step of retrieving an identifier of said peripheral of the set of peripherals further comprises retrieving the list of unnecessary messages from said
15 table based upon said identifier of said peripheral.

9. The method of reducing message traffic as in claim 8 wherein the step of retrieving the list further comprises comparing an identifier of the message with
20 the list of unnecessary messages transmitted from said peripheral to the automatic call distributor.

10. The method of reducing message traffic as in claim 9 wherein the step of comparing the identifier of the message with the list of unnecessary messages further
25 comprises discarding the message when a match is found between the identifier of the message and an entry of the list of unnecessary messages.

30 11. Apparatus for reducing message traffic in an automatic call distributor, such apparatus comprising:

means for forming a message table adapted to control messages forwarded to a peripheral of the automatic call distributor; and

means for amending the table upon startup of the
5 peripheral.

12. The apparatus for reducing message traffic as in claim 11 further comprising means for forming a list of identifiers of unnecessary messages in the peripheral
10 upon startup.

13. The apparatus for reducing message traffic as in claim 12 wherein the means for forming the list of unnecessary messages further comprises means for
15 retrieving the list from memory.

14. The apparatus for reducing message traffic as in claim 13 further comprising means for sending the list of unnecessary messages to the automatic call
20 distributor.

15. The apparatus for reducing message traffic as in claim 14 wherein the means for sending the list of unnecessary messages further comprises means for
25 storing the list in said table of the automatic call distributor.

16. The apparatus for reducing message traffic as in claim 15 further comprising means for forming a message
30 for transmission to a set of peripherals, including said peripheral.

17. The apparatus for reducing message traffic as in
claim 16 wherein the means for forming a message for
transmission to a set of peripherals further comprises
means for retrieving an identifier of said peripheral
5 of the set of peripherals.

18. The apparatus for reducing message traffic as in
claim 17 wherein the means for retrieving an
identifier of said peripheral of the set of peripherals
10 further comprises means for retrieving the list of
unnecessary messages from said table based upon said
identifier of said peripheral.

19. The apparatus for reducing message traffic as in
15 claim 18 wherein the means for retrieving the list
further comprises means for comparing an identifier of
the message with the list of unnecessary messages
transmitted from said peripheral to the automatic call
distributor.

20
20. The apparatus for reducing message traffic as in
claim 19 wherein the means for comparing the identifier
of the message with the list of unnecessary messages
further comprises means for discarding the message when
25 a match is found between the identifier of the message
and an entry of the list of unnecessary messages.

21. Apparatus for reducing message traffic in an
automatic call distributor, such apparatus comprising:
30 a message table within a memory of the automatic
call processor adapted to control messages forwarded to
a peripheral of the automatic call distributor; and

a message processor adapted to amend the table upon startup of the peripheral.

22. The apparatus for reducing message traffic as in
5 claim 21 further comprising a table within a memory of the peripheral adapted to form a list of identifiers of unnecessary messages in the peripheral upon startup.

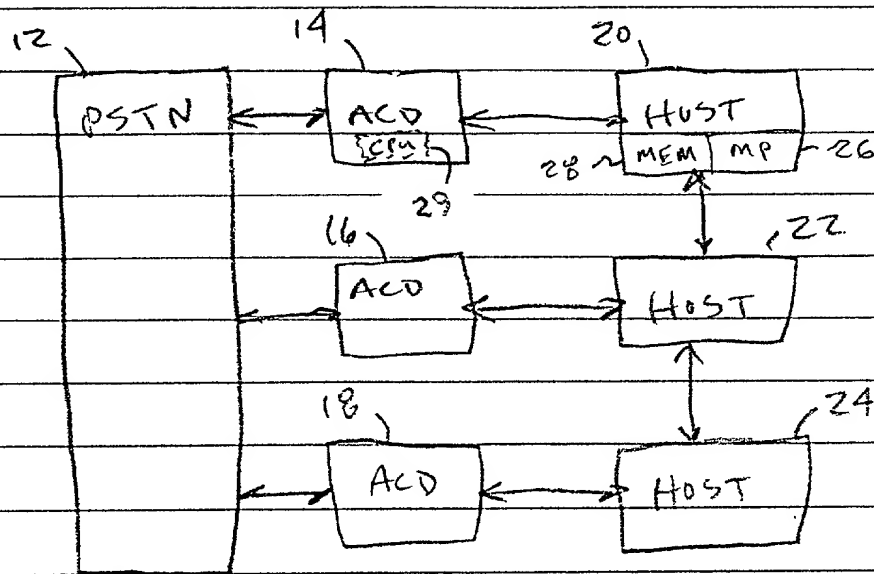
23. The apparatus for reducing message traffic as in
10 claim 22 wherein the table for forming the list of unnecessary messages further comprises a peripheral processor adapted to retrieve the list from memory.

24. The apparatus for reducing message traffic as in
15 claim 23 further comprising a communication processor adapted to send the list of unnecessary messages to the automatic call distributor.

25. The apparatus for reducing message traffic as in
20 claim 24 wherein the communication processor adapted to send the list of unnecessary messages further comprises a receiving processor adapted to storing the list in said table of the automatic call distributor.

Abstract

A method and apparatus are provided for forwarding messages among peripherals of an automatic call distributor. The method includes the steps of forming
5 a message table in a first peripheral of the automatic call distributor and forwarding a message from the first peripheral to a second peripheral of the automatic call distributor based upon a content of the message table.



10
FIG. 1

	<u>MESSAGE SOURCE</u>	<u>MESSAGE TYPE</u>	<u>OBJECT</u>
38 →	ACD 14	OVERFLOW	AGENT #1
40 →	HOST 24	FAULT	ANI
42 →			DNIS
44 →			TRUNK #
46 →	HOST 1		
48 →	HOST 2		
50 →	HOST 3		

36

FIG. 3

004630 00000000

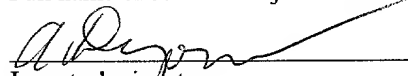
That all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

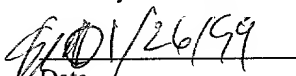
I hereby appoint the following attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and request that all correspondence and telephone calls in respect to this application be directed to WELSH & KATZ, LTD., 120 South Riverside Plaza, 22nd Floor, Chicago, Illinois 60606, Telephone No. (312) 655-1500.

<u>Attorney</u>	<u>Registration No.</u>
Donald L. Welsh	16,665
A. Sidney Katz	24,003
Richard L. Wood	22,839
Jerold B. Schnayer	28,903
Eric C. Cohen	27,429
Joseph R. Marcus	25,060
Gerald S. Schur	22,053
Gerald T. Shekleton	27,466
James A. Scheer	29,434
Daniel R. Cherry	29,054
Edward P. Gamson	29,381
Kathleen A. Rheintgen	34,044
Thomas W. Tolpin	27,600
Eric D. Cohen	38,110
Jon P. Christensen	34,137
Walter J. Kawula, Jr.	39,724
Leonard Friedman	37,135
Ik Hyun Seo	40,165
Philip D. Segrest	39,021
Jeffrey W. Salmon	37,435
Mitchell J. Weinstein	37,963
William C. Cray	27,627
John J. Deinken	28,406
Kyle Eppele	34,155
John J. Horn	28,803
John M. Miller	38,560
Susie H. Oh	36,391
James P. O'Shaughnessy	27,667
Keith L. Stephens	32,632
Philip K. Yu	35,742

Full name of sole or one joint inventor:

Anthony J. Dezonno


Inventor's signature


Date

Residence and Post Office Address:

233 Pinewood Lane
Bloomington, Illinois 60108

Citizenship:

United States

Address for Correspondence:

WELSH & KATZ, LTD.
120 South Riverside Plaza
22nd Floor
Chicago, Illinois 60606